Electronic Version
Stylesheet Version v1.1.1

Claims

[c1] 1A method for designing a liquid crystal display device, the method comprising the steps of:
based upon at least one viewing angle among a plurality of liquid crystal display films, determining a range of a gap between liquid crystal cells of a liquid crystal display device;
based upon the panel transmittance and gamut of a plurality of liquid crystal modules, determining at least one value of the gap between liquid crystal cells of the liquid crystal display device;
based upon optic characteristics of a plurality of color filter films and color modules, determining a set of optic characteristics for a color filter as well as for the liquid crystal display device; and
adjusting values related to the set of optic characteristics of the liquid crystal display device and the color filter, thereby producing a set of adjusted values for present as well as future design purposes.

[c2] 2.The method of claim 1, wherein the range of the gap is determined using at least two values of the gaps of the plurality of liquid crystal display films along with the

viewing angles corresponding thereto, thereby establishing a formula expressing the range using the values of the gaps and their corresponding viewing angles.

[c3] 3.The method of claim 2, wherein the formula is obtained using trendline regression.

[c4] 4.The method of claim 1, wherein the at least one value of the gap between liquid crystal cells of the liquid crystal display device is determined using the panel transmittance and gamut of a plurality of liquid crystal modules for establishing a plurality of relationships between the panel transmittance and the gamut therewith.

[c5] 5.The method of claim 4, wherein the panel transmittance is defined as follows:
panel transmittance = Y * aperture ratio correction * gap of liquid crystal cell correction * measured value correction,
where Y denotes optic characteristic co-ordinate values; aperture ratio correction is defined as the ratio of product or device aperture rate with the standard module opening rate; and the gap of liquid crystal is derived using a predetermined gap value and equation (2).

[c6] 6The method of claim 4, wherein the relationship between the panel transmittance and the gamut is deter-

mined by trendline regression.

[c7] 7.The method of claim 1, wherein the optic characteristics of the module are determined by color filter film thickness.

[c8] 8.The method of claim 7, wherein the optic characteristics of the module are derived using trendline regression.

[c9] 9.The method of claim 1, wherein the optic characteristics include a set of products, wherein each product has factor one which is the ratio of measured value with modeled value and factor two which is a correction of the optic characteristics.

[c10] 10.The method of claim 1, wherein the color module includes liquid crystal film and color filter film.

[c11] 11.A method for designing a liquid crystal display module suitable for developing a system for designing a product, the system includes a database, wherein color characteristic parameters relating to a plurality of liquid crystal film, to a plurality of color filter film, to a plurality of testing modules, and to a plurality of standard module are stored therein, the method comprising the steps of: based upon data relating to a plurality of liquid crystal cell gaps and their respective viewing angle, providing an

expression of the relationships between the viewing angles and cell gaps, and deriving a range of the cell gaps;
based upon data relating to a plurality of panel transmittance and their respective color gamut, providing an expression of the relationships between the plurality of panel transmittance and their respective color gamut, and deriving at least one cell gap value;
based upon data relating to the plurality of color filter films and testing modules, providing a set of expressions of relationships including the relationship of color filter film thickness with color filter characteristics, the relationship of color filter characteristics with liquid crystal testing module, and determining color filter standard and product standard based upon the above relationship; and
correcting product color characteristics based upon the ratio of measured value with modeling value.

[c12] 12The method of claim 11, wherein the testing module includes at least one liquid crystal film and a set of color filter films.

[c13] 13.The method of claim 11, wherein the expression of the relationships between the viewing angles and cell gaps are expressed using trend line regression.

[c14] 14.The method of claim 11, wherein the panel transmit-

tance is defined as follows:

panel transmittance = Y * aperture ratio correction * gap of liquid crystal cell correction * measured value correction,

where Y denotes optic characteristic co-ordinate values; aperture ratio correction is defined as the ratio of product or device aperture rate with the standard module opening rate; and the gap of liquid crystal is derived using a predetermined gap value and equation (2).

[c15] 15.The method of claim 11, wherein the relationship between the panel transmittance and the gamut is determined by trendline regression.

[c16] 16.The method of claim 11, wherein the expressions of relationship is derived using trendline regression.

[c17] 17.A system for designing a liquid crystal module for designing a prototype of a product, the system includes means for performing a method comprising the following steps:

based upon at least one viewing angle among a plurality of liquid crystal display films, determining a range of a gap between liquid crystal cells of a liquid crystal display device;

based upon the panel transmittance and gamut of a plurality of liquid crystal modules, determining at least one

value of the gap between liquid crystal cells of the liquid crystal display device;
based upon optic characteristics of a plurality of color filter films and color modules, determining a set of optic characteristics for a color filter as well as for the liquid crystal display device; and
adjusting values related to the set of optic characteristics of the liquid crystal display device and the color filter, thereby producing a set of adjusted values for present as well as future design purposes.

[c18] 18.The system of claim 17, wherein the steps of the method are implemented using a computer program.

[c19] 19.A system for designing a liquid crystal module for designing a prototype of a product, the system includes a data base, wherein color characteristic parameters relating to a plurality of liquid crystal film, to a plurality of color filter film, to a plurality of testing modules, and to a plurality of standard module are stored therein, the system includes a method comprising the steps of:
based upon data relating to a plurality of liquid crystal cell gaps and their respective viewing angle, providing an expression of the relationships between the viewing angles and cell gaps, and deriving a range of the cell gaps;
based upon data relating to a plurality of panel transmittance and their respective color gamut, providing an ex-

pression of the relationships between the plurality of panel transmittance and their respective color gamut, and deriving at least one cell gap value;
based upon data relating to the plurality of color filter films and testing modules, providing a set of expressions of relationships including the relationship of color filter film thickness with color filter characteristics, the relationship of color filter characteristics with liquid crystal testing module, and determining color filter standard and product standard based upon the above relationship; and
correcting product color characteristics based upon the ratio of measured value with modeling value.

[c20] 20.The system of claim 19, wherein a computer program is used to perform the steps.